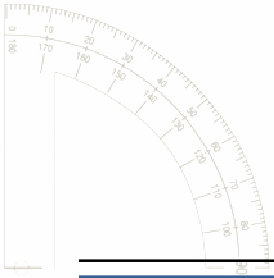




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**Research
Partnership to
Secure Energy
for America**

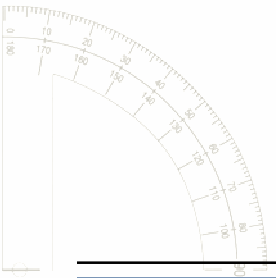
**RPSEA Ultra-Deepwater
Advisory Committee**
Christopher Haver
Arlington, VA
June 21, 2007

Secure Energy for America



Contents

- What is DeepStar?
- EPACT Subpart J – UDW Focus
- We Can Make a Difference
- RPSEA UDW Objectives
- UDW Annual Process – Off and Running!

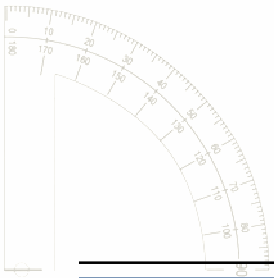


Significant Contributions Since 1992

DeepStar is a collaborative industry led forum focused on:

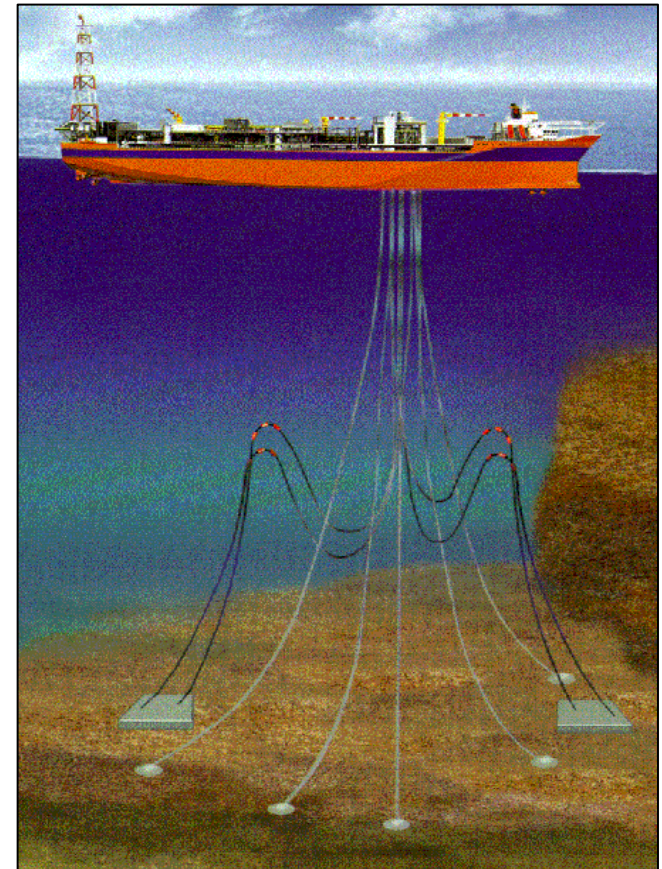
- Enhancing existing deepwater technologies.
- Developing new enabling deepwater technologies.
- Gaining the acceptance of deepwater technologies by regulators and industry.
- Providing a forum and a process for discussion, guidance and feedback with contractors, vendors, operators, regulators and academia, regarding deepwater production system technology.

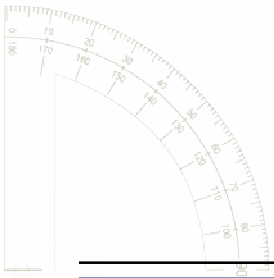




“Focused”

Ultra-Deepwater Resources.—
Awards from allocations under
section 999H(d)(1) **shall focus on**
the development and demonstration
of **individual exploration and**
production technologies as well as
integrated systems technologies
including **new architectures** for
production in ultra-deepwater.

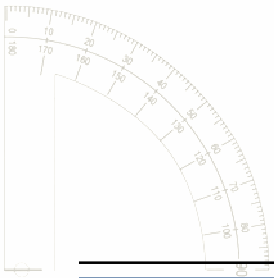




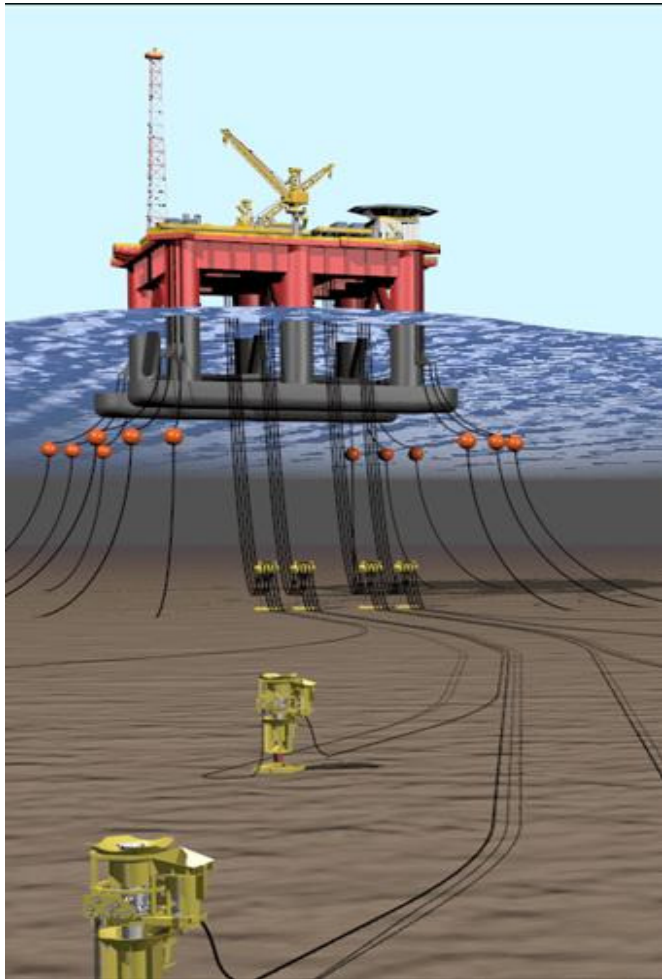
Deepwater versus Ultra-Deepwater

- **DEEPWATER.**—The term “deepwater” means a water depth that is greater than 200 but less than 1,500 meters.
- **ULTRA-DEEPWATER.**—The term “ultra-deepwater” means a water depth that is equal to or greater than 1,500 meters.

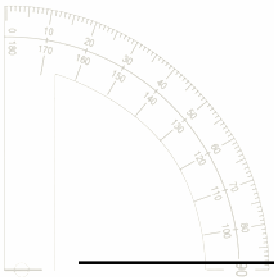




Technology Focus



- **ULTRA-DEEPWATER ARCHITECTURE.**—The term “ultra-deepwater architecture” means the integration of technologies for the exploration for, or production of, natural gas or other petroleum resources located at ultra-deepwater depths.
- **ULTRA-DEEPWATER TECHNOLOGY.**—The term “ultra-deepwater technology” means a discrete technology that is specially suited to address one or more challenges associated with the exploration for, or production of, natural gas or other petroleum resources located at ultra-deepwater depths.
- Also includes: drilling to formations in the Outer Continental Shelf to depths greater than 15,000 feet.



We Can Make a Difference

MMS estimates there is more than 50 billion recoverable BOE remaining to be discovered in the GOM in deep and ultra-deepwater (2000).

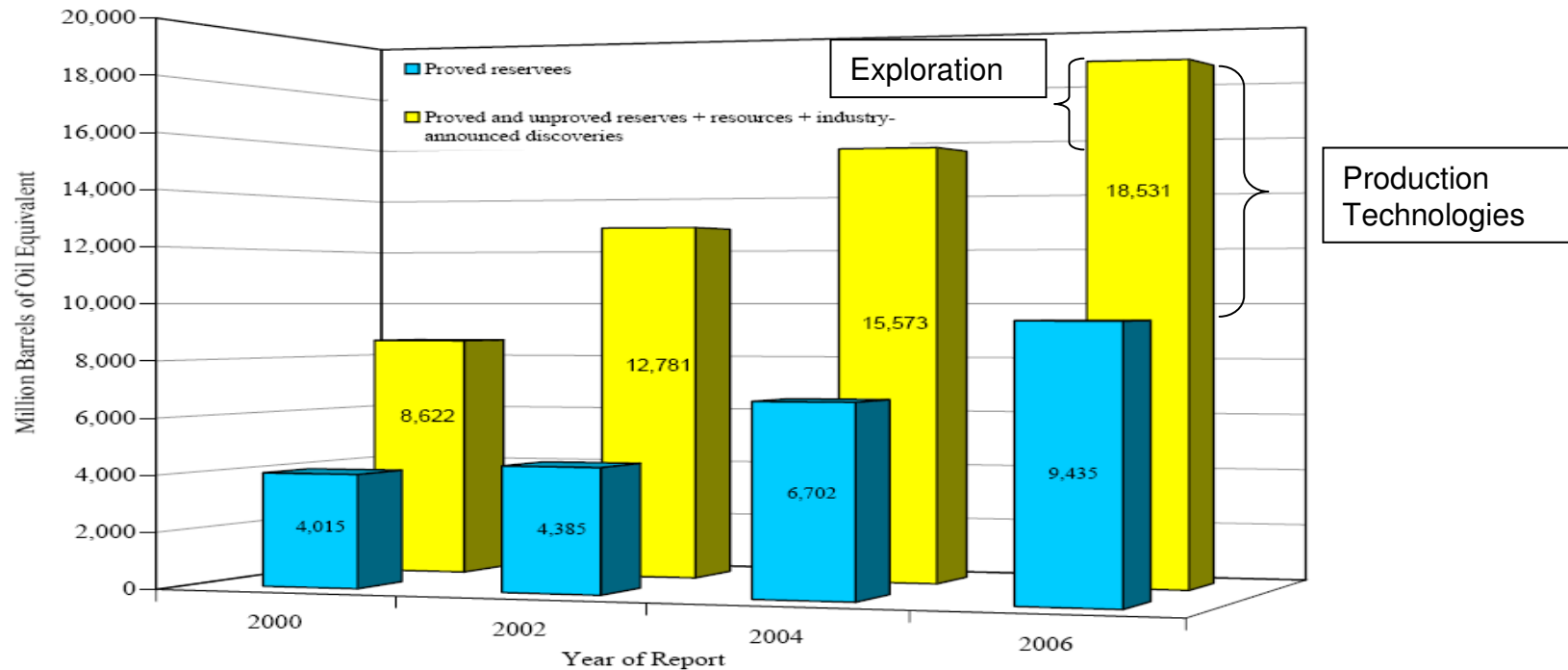
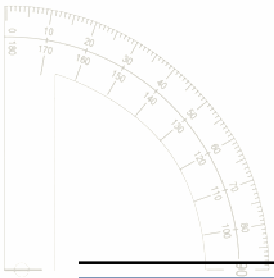


Figure 78. Comparison of 2000, 2002, 2004, and 2006 deepwater GOM reports: successive increases in deepwater BOE.



RPSEA UDW Objectives

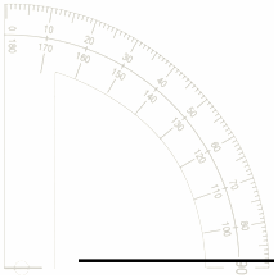
1. Increase the supply of UDW Oil and Gas resources,
2. Reducing the costs to find, develop and produce such resources,
3. Increasing the efficiency of exploration for such resources,
4. Increasing production efficiency and ultimate recovery of such resources,
5. Improving safety, and
6. Improving environmental performance, by reducing any environmental impacts associated with UDW exploration and production.





Draft Annual Plan Input

Event Type	Location	Date	Description
Roadmap session	Houston, Tx. (Tx. A&M & RPSEA)	Oct05	Ultra-Deepwater Technology Roadmap Workshop; led by Tx. A&M, 100+ participants, 6 break-out sessions and final report
RPSEA Forums	Cambridge, MA. (MIT)	Oct06	Autonomous Intervention for Deepwater O&G Operations Forum
	Los Angeles, CA (USC)	Nov06	Ultra-deepwater Resources
	Houston, TX. (MIT & Chevron)	Jan07	Vortex Induced Vibrations Forum
	Tulsa, OK (University of Tulsa & Halliburton)	Feb07	Flow Assurance
RPSEA Advisory workshops	Houston, TX.	Oct06-Feb07	Technical Advisory Committees; numerous over this timeframe including hundreds of experts
Other	NPC study	Nov06	Draft Technical Section information
	RPSEA PAC & DeepStar Systems Engineering		Identification of Technology Needs study; 7902 report



RPSEA UDW Structure PAC and TACs

Resource of >700 SMEs from industry, academia and government!

Program Advisory Committee
“The PAC”

Regulatory TAC (X100)
51 Active Members

Flow Assurance TAC (X200)
100 Active Members

Subsea Systems TAC (X300)
138 Active Members

Floating Systems TAC (X400)
150 Active Members

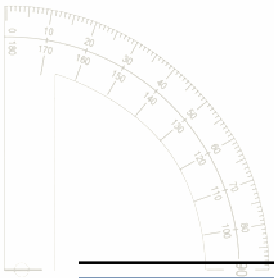
Drilling & Completions TAC (X500)
66 Active Members

Reservoir Engineering TAC (X700)
44 Active Members

Met Ocean TAC (X800)
55 Active Members

Systems Engineering TAC (X900)
76 Active Members

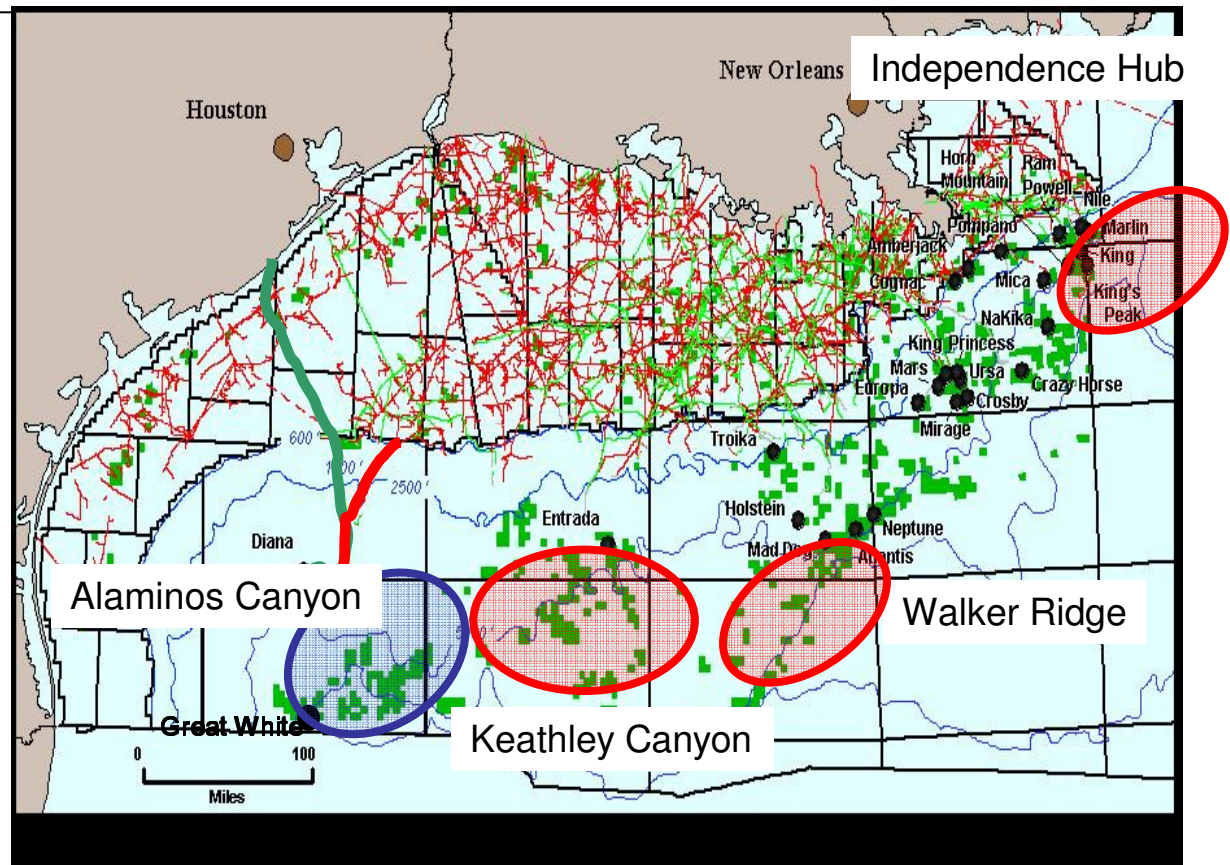
Geoscience TAC (X000)
15 Active Members

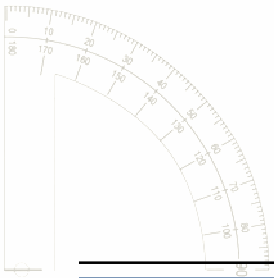


RPSEA UDW Focus Area GOM

Deepwater Trends

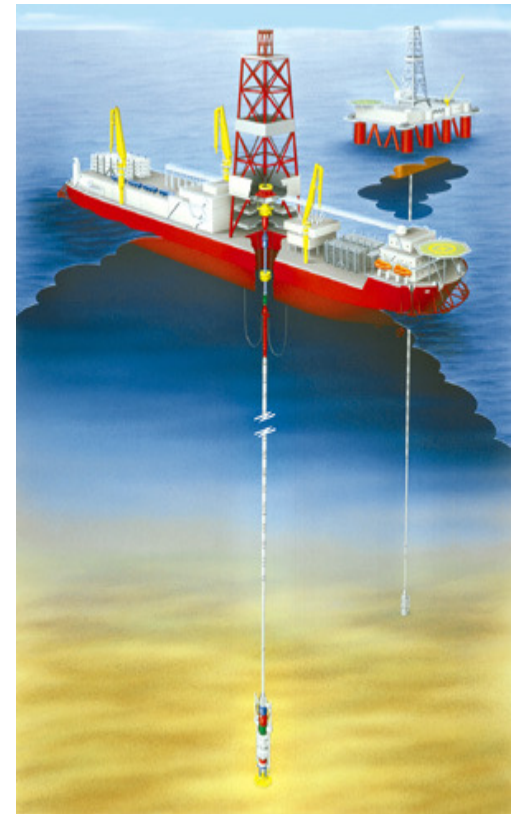
- **Walker Ridge / Keathley Canyon**
 - Sub-salt
 - Deeper wells
 - Tight formations
 - **Alaminos Canyon**
 - Viscous crude
 - Lacking infrastructure
 - **Eastern Gulf – Gas Independence Hub**
 - Higher pressure
 - Higher Temperature
 - CO₂ / H₂S
- Higher Drilling Costs**
Challenging Economics





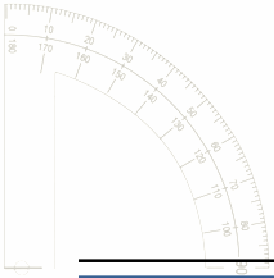
UDW Base Cases

- 4 deepwater Reservoir Base Cases focus work.
 - Canopy – (Subsalt; low perm)
 - Coyote – (Low energy reservoir)
 - Gumout – (Viscous Production)
 - Diablo (XHPHT Field)

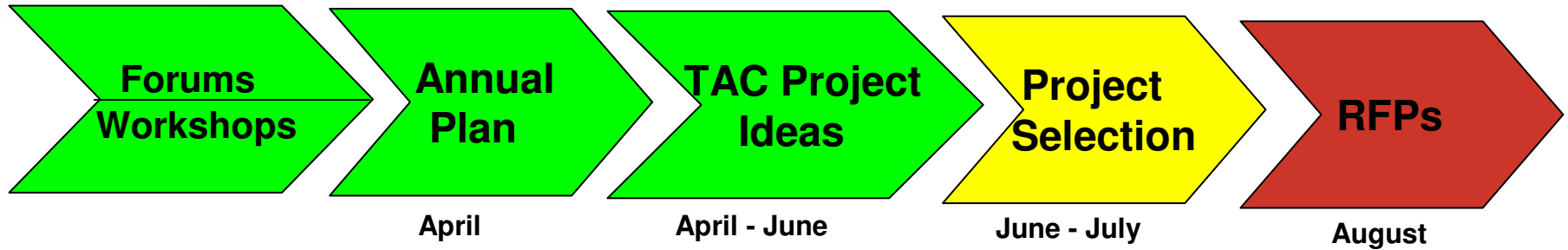


Themes

Field Type / Focus Areas	Technology Challenge	Themes
Canopy Field	Low permeability reservoir	1. Completion of long reservoir sections. (S3) 2. Deep reservoir stimulation technology. (S2) 3. Formation Integrity at Commercial Production Conditions (fluid rates, differential pressures). (S3)
Gumout Field	High Viscosity Oil	4. Intervention strategies and well architecture for downhole equipment maintenance (e.g., pumps). (S1) 5. Viscous Oil Production Technology. (S2)
Coyote Field	Small Reserve Fields	6. Drilling with small margin between overburden and fracture pressure (dual density drilling is a potential solution for this issue). (S2)
Diablo Field	XHPHT (22.5 ksi & 350+°F) Sour service	7. Materials Sciences for UDW Risers and Moorings, tubulars, tools, instrumentation, and completion equipment. (S2) 8. HPHT Flow Assurance Technologies. (S1) 9. HPHT Formation Evaluation. (S2)
Crosscutting	Environmental	10. Safety Barrier Testing and Validation Criteria. (S1) 11. Environmental and Regulatory Impact of Emerging Technologies. (S2) 12. Deepwater Produced Water Management. (S2)
	Floating Facilities	13. Optimized UDW Field Development Concepts for Improved Economics. (S1) 14. Improved Design and Analysis Methods. (S1) 15. Mooring and Riser Integrity Management. (S1)
	Flow Assurance	16. Organic, Inorganic and Solids Management. (S1)
	Geo-Science	17. Subsalt Imaging & Geo-mechanics. (S1) 18. Reservoir & Fluid Characterization. (S2) 19. Economics. (S3)
	Met-ocean	20. Effect of changing weather patterns on hurricane severity. (S2) 21. Operational 3-D current forecast model capable of simulating the Loop/eddies. (S1) 22. Modeling for strong near-bottom currents along the Sigsbee Escarpment. (S3)
	Reservoir	23. Appraisal. (S1) 24. Field development. (S2) 25. Production and Reservoir Surveillance. (S2)
	Subsea Facilities	26. Subsea Production Equipment Enhancements. (S1) 27. Mature Subsea Processing Technology. (S1) 28. Pipeline, Flowline and Umbilical Technology. (S2) 29. Subsea Well Intervention Tech. improvement. (S1)
	Systems Engineering and Architecture	30. Design Criteria for the Base Cases. (S1) 31. System impact of proposed technologies on the field development scenarios. (S2) 32. Grand Challenge projects (S1) 33. Small Business Initiatives (S1)

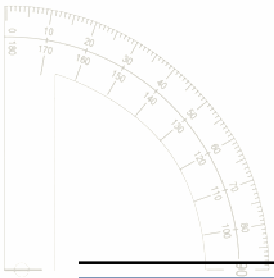


Off and Running!





Questions



Off and Running!

